| | |
|---|---|
| **From:** | DeMaria, Eva |
| **To:** | PUGH Mark |
| **Cc:** | GREENFIELD Sarah; Michael Allen (allenmc@cdmsmith.com); Sheldrake, Sean; Matt McClincy (mcclincy.matt@deq.state.or.us) |
| **Subject:** | RE: GeoDesign draft Work Plan, Bank Stability Analysis: Sulzer Pumps Facility - DEQ ECSI No. 1235 |
| **Date:** | Thursday, April 28, 2016 9:10:00 AM |

Mark -

EPA agrees that the BANCS model is appropriate for evaluating erodibility of the riverbank. The BANCS model uses BEHI, which considers key factors in assessing erodibility of the riverbank. The evaluation of Near Bank Stress (NBS) should take into account boat and wind induced waves. The visual inspection of the riverbank to document bank material and bank stratification should be supplemented by boring log soil descriptions from borings drilled in the riverbank.

Modification of the riverbank should take into consideration the overall slope stability. Things to consider for a slope stability evaluation should include:

- A desktop study to review available geology map(s) and identify potential geologic hazards. Is the site susceptible to slope failure or does the area have the potential to experience slope instability and liquefaction?
- Site reconnaissance to observe and map existing conditions and surface materials. Is there evidence of bank erosion and slope instability?
- Limited geotechnical field investigation and borings on top and toe (if possible) of the bank to characterize the overall subsurface condition;
- Limited geotechnical lab testing to evaluate strength characteristics, gradation, and index properties to aid in subsurface characterization for overall bank slope stability;
- Perform a limited slope stability analysis to evaluate existing slope stability. Does it have adequate factor of safety (>1.5)? If inadequate, evaluate mitigation measures to stabilize, flatten slope, or place buttress rock fill at the toe for stabilization.

Also note that the JSCS (Section 5.1.2 Erodable Surface Soils or Riverbank Materials) states, "If surface soil concentrations exceed soil SLVs, a qualitative or quantitative weight-of-evidence evaluation should be performed by the upland PRP to evaluate the likelihood of adverse effects from migration of soils to surface water and sediment and to determine if soils source control measures are required." The JSCS lists the following under the weight-of-evidence approach:

- Site surface conditions (e.g., exposed soil, paved, slope);
- Riverbank stability (e.g., potential for erosion under extreme rainfall events, potential for erosion under flood conditions, bank erosion rates);
- Soil properties (e.g., soil type, compaction, erodability, permeability);
- Evaluation of potential soil erosion and contaminant transport (e.g., modeling, quantitative erosion calculations).

Let me know if you have questions. Thanks.

Eva

---

**From:** PUGH Mark [mailto:PUGH.Mark@deq.state.or.us]
**Sent:** Monday, April 25, 2016 12:22 PM
**To:** DeMaria, Eva
**Cc:** GREENFIELD Sarah
**Subject:** RE: GeoDesign draft Work Plan, Bank Stability Analysis: Sulzer Pumps Facility - DEQ ECSI No. 1235

Eva,

Myself and Sarah Greenfield, our lead engineer for Portland Harbor, have reviewed various bank stabilization methods for Portland Harbor, including the ODOT approach which you previously provided info for, and the BANCS model approach, which originally was proposed by Sulzer. BANCs is an acronym for "Bank Assessment of Non-point source Consequences of Sediment". The model is summarized as follows:

The BANCS model uses a Bank Erosion Hazard Index(BEHI) and a Near Bank Stress (NBS) to assess the potential for erosion of a streambank.

The BEHI, originally developed by Dave Rosgen, considers the following:

- Bank height relative to bankfull height
- Root depth and root density
- Bank angle
- Surface protection
- Bank material
- Bank stratification

All of these elements will be measured based on visual assessment and refined with desktop analysis. Sulzer proposes to conduct a visual inspection, including an under-dock inspection from a boat. On-site observations and photographs will be used to document the bank conditions, including bank material, bank stratification, bank angle, surface protection, and vegetation types. Desktop analysis will be used to refine the analysis as needed (e.g., GIS-based measurements or root depth and density estimates based on vegetation type).

DEQ plans of approving the BANCS approach as it captures elements of the ODOT approach but is more rigorous and will provide a more quantitative assessment. I am not requesting EPA to review the work plan, but seeking concurrence with this approach in general. If possible, please respond within 2 weeks. Please contact me should you have any questions. Thanks again.

*Mark Pugh, R.G.*
*DEQ NW Region*
*700 NE Multnomah St.*
*Suite 600*
*Portland, Oregon 97232*
*503 229-5587*
*e-mail:* pugh.mark@deq.state.or.us
visit DEQ's website at State of Oregon: Department of Environmental Quality
DEQ's ECSI Database:Oregon DEQ: Land Quality - Environmental Cleanup Site Information (ECSI) Database